



FBEI UPDATES: Costs of Production

Updates on Farm Business Economic Indicators

Wheat Production Costs, Income, and Farm Characteristics

In this report... Costs of producing wheat per acre and per bushel vary considerably among wheat growing regions, due primarily to differences in yields, input use, irrigation, and cropping practices. In 1994, the Central and Southern Plains, a major wheat region, produced wheat at an average economic cost of \$4.83 per bushel (or \$137 per acre), while the Southeast produced wheat at the lowest cost, \$3.24 per bushel (or \$152 per acre).

During the winter of 1995, USDA surveyed wheat growers in 21 States for the 1994 production year. These farms accounted for about 82 percent of the U.S. wheat production in 1994. This report contains some of the preliminary findings from the survey. A later report will fully explain wheat production costs, distributions, input use, farm characteristics, and other production factors at various levels, including an analysis of the effects of Government program participation on wheat production costs and returns.

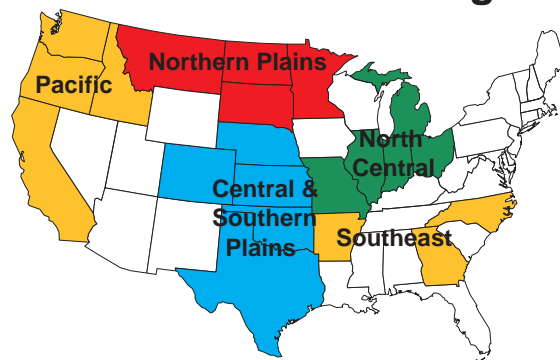
'94 Production Costs

U.S. farmers planted wheat on 70.3 million acres in 1994 and produced 2,320 million bushels, down 3.1 percent from 1993. Based on USDA's survey, cash costs of producing 1994 U.S. wheat averaged \$2.47 per bushel (\$82 per planted acre); total economic costs averaged \$4.63 per bushel (\$155 per acre). Fertilizer, seed, and chemicals accounted for half of the variable costs. At the average harvest-month price of \$3.16 per bushel, 78 percent of wheat growers were able to cover cash costs. When capital replacement costs were included, 62 percent of growers were able to cover costs and when a charge for unpaid labor was also included, 51 percent of growers were able to cover costs.

At the regional level, cash costs varied due to differences in cropping practices, input use, and irrigation. Total cash costs ranged from a low of \$70 per acre in the Northern Plains to \$147 in the Pacific. The Pacific region had the highest costs due primarily to irrigation-related expenses. About one fourth of Pacific wheat acreage was irrigated, compared with almost no irrigation in other regions.

On average, the value of wheat at harvest time covered the cash costs in every region, while value covered cash costs plus capital replacement in all

Wheat Production Regions



regions except the Central and Southern Plains. Total economic costs were covered only in the North Central region. Also, this region's wheat growers had positive returns to management and risk. Relatively higher grain yields there and a large portion of wheat acres harvested for straw which has a high value as a secondary product contributed to the positive returns.

On a per-bushel basis, cash costs varied greatly among regions due to yields, ranging from \$1.94 to \$2.67; economic costs ranged from \$3.24 to \$5.14 per bushel. Although, the Plains had the lowest costs per acre, they had the highest per-bushel costs due primarily to poor yields. This region's growers harvested about 20 percent less wheat than what they expected in 1994.

Other Relevant Regional Factors

The most important region in terms of wheat production was the Central and Southern Plains, followed by the Northern Plains. Together these two regions typically account for two-thirds of total U.S. production. The region with the least wheat was the Southeast, accounting for less than 5 percent of the total wheat crop. The predominant type of wheat grown varied among the regions—hard red winter wheat in the Central and Southern Plains, soft red winter wheat in the North Central and Southeast, and white winter wheat in the Pacific, with a mixture of spring wheat and durum in the Northern Plains region.

Summer fallow and double cropping were two other important practices that varied among

regions. Pacific growers planted more than half of their wheat on previously fallowed land, compared with one third in the Plains regions and none in eastern regions. On the other hand, double cropping was only reported in eastern regions. In the Southeast, three fourths of the wheat was double cropped, most likely with soybeans. Wheat pasture in the Central and Southern Plains and wheat straw in the North Central were important secondary products.

Distribution of Costs

Estimated 1994 variable costs were converted to a per-bushel basis and ranked from lowest to highest to form a weighted cumulative distribution of farms and production. These costs were then compared with the distribution estimated from 1989 costs.

Twenty-five percent of farms had per-bushel variable costs of \$1.12 or less (low-cost), and accounted for 19 percent of the total production. A majority of these low-cost growers were in the North Central region. At the other end of the distribution, 25 percent of farms had variable costs of \$2.22 or more per bushel (high-cost) and accounted for 21 percent of the wheat production. Three-fourths of these growers were in Plains regions.

Variable costs varied greatly among cost groups, ranging from \$0.93 to \$3.21 per bushel, due primarily to differences in expected vs. actual yields. High-cost growers expected 37 bushels, but harvested 15 bushels less wheat per acre. Low-cost growers harvested 44 bushels per acre, 3 bushels more than what they expected.

When compared with cost distributions in 1989, low-cost growers had variable cash costs of \$1.37 or less and accounted for a higher percent of wheat

production than that of 1994 (31 vs. 19 percent). On average, the low-cost group planted wheat on 219 acres as part of 1,348 operated acres. This indicates that the low-cost group had a relatively larger-sized operation in 1989 than their counterparts in 1994, due primarily to a large number of these growers being located in the Plains regions (53 vs. 36 percent).

High-cost growers in 1989 had variable costs of \$3.49 or more and accounted for slightly less of the wheat crop when compared with 1994. These growers expected 29 bushels of wheat per acre, but harvested only 7 bushels. Note that wheat yields in 1989 were the lowest since 1978 (a total of 2.04 billion bushels were produced on 76.6 million acres). Three-fourths of high-cost growers were in the Central and Southern Plains region.

Other distinctions included: wheat growers in 1994 had higher wheat yields, were in a relatively better financial position and carried less debt. Low-cost growers owned more and rented less land on a share basis, and, although the value of all commodities produced on low-cost farms increased, wheat's contribution to the total value declined from 21 percent in 1989 to only 9 percent in 1994.

Differences in operator characteristics, input use, and cropping practices such as use of irrigation, summer fallow, double cropping, and grazing did not change significantly between the two surveys.

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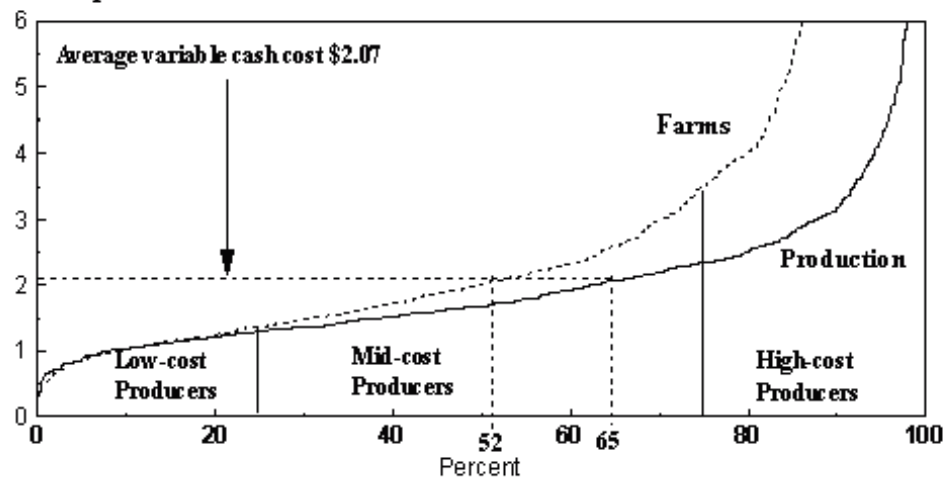
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Cumulative distribution of wheat variable cash costs , 1989

About 52 percent of FCRS wheat farms in 1989 had variable costs at or below the average cost of \$2.07 per bushel, representing 65 percent of wheat production.

Dollars per bushel



Cumulative distribution of wheat variable cash costs, 1994

About 60 percent of FCRS wheat farms in 1994 had variable costs at or below the average costs of \$1.80 per bushel, representing 64 percent of what production.

Dollars per bushel

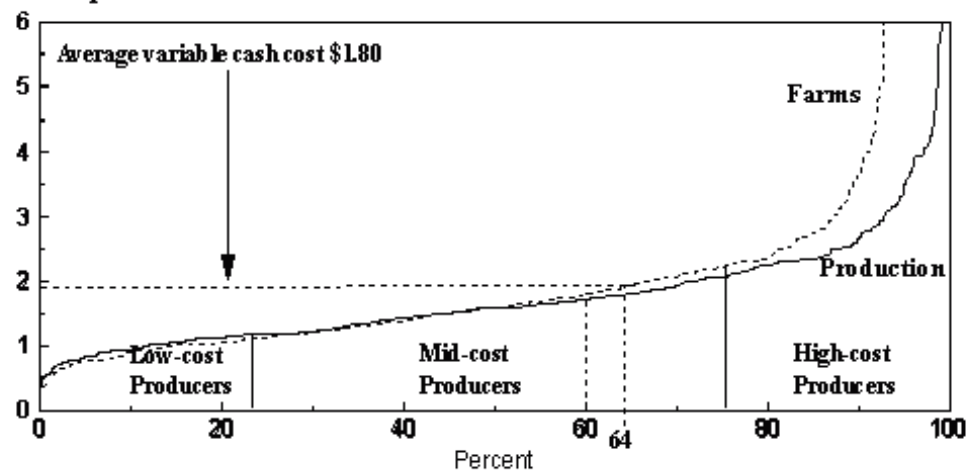


Table 1—Production costs and input use of average wheat farms, by region, 1994

Item	Unit	Region					All FCRS farms
		North Central	South-east	Northern Plains	Central and Southern Plains	Pacific	
Share of FCRS:							
Wheat acres	percent	8	3	40	41	8	100
Wheat production	do.	13	4	33	35	15	100
Wheat planted acres	acres	49	114	370	281	293	214
Wheat yield, actual	bushels/acre	53.44	47.03	27.85	28.46	59.96	33.40
Wheat yield, expected	do.	53.45	46.79	34.65	36.39	63.58	39.62
Costs:							
Variable cash costs	dollars/acre	72.16	81.41	50.31	54.97	110.90	59.98
Fixed cash costs	do.	31.25	19.83	19.62	20.98	36.34	22.49
Total, cash costs	do.	103.41	101.24	69.93	75.95	147.24	82.47
Economic costs	do.	177.69	152.25	143.19	137.42	271.07	154.52
Returns:							
Gross returns	do.	182.76	140.89	92.78	91.65	202.23	110.09
Returns above cash costs	do.	79.35	39.65	22.85	15.70	54.99	27.62
Returns above economic costs	do.	5.07	-11.36	-50.41	-45.77	-68.84	-44.43
Seed:							
Rate, total	bushels/acre	2.05	2.07	1.60	1.16	1.41	1.45
Home-grown	percent of seed	29	19	54	49	23	45
Fertilizer use:							
Nitrogen	percent of farms	100	92	89	83	94	91
Phosphorous	do.	87	51	79	44	44	67
Potassium	do.	81	58	28	6	13	40
Nitrogen	pounds per acre	85	74	50	52	73	57
Phosphorus	do.	59	27	22	15	13	22
Potassium	do.	66	44	3	1	2	8
Chemical use:							
Any chemicals	percent of farms	19	46	85	38	94	46
Herbicides	do.	19	39	85	35	94	45
Insecticides	do.	d	10	d	8	9	4
Herbicide	acre-treatment	.18	.55	1.23	.36	1.27	.77
Tillage system use:							
Conventional tillage	percent of farms	64	74	64	87	85	73
Conservation tillage	do.	37	26	36	13	15	27
Tillage and planting	field passes	2.73	3.07	3.62	4.81	4.45	3.71
Tillage and planting	hours per acre	1.11	.54	.49	.65	.66	.77
Soil surface covered	percent	27	19	24	18	13	22
Custom operations:							
Any custom operations	percent of farms	50	75	57	70	83	61
Cultivation and planting	do.	5	14	23	20	41	17
Fert/chemical application	do.	44	67	44	50	70	49
Harvesting/hauling	do.	13	27	19	36	34	23
Fuel:							
Diesel	gallons per acre	2.99	4.17	4.13	5.41	7.82	4.87
Gasoline	do.	2.73	2.43	2.42	2.58	2.80	2.55
Labor (unpaid)	hours per acre	1.36	1.12	.95	1.52	2.03	1.39

Table 2—Characteristics of average wheat farms, by region, 1994

Item	Unit	Region					All FCRS farms
		North Central	South-east	Northern Plains	Central and Southern Plains	Pacific	
Share of FCRS:							
Wheat farms	percent	34	6	23	31	6	100
Wheat production	do.	13	4	33	35	15	100
Size:							
Operated acreage	acres	542	653	1,608	1,260	1,284	1,062
Planted wheat acreage	do.	49	114	370	281	293	214
Sales class:							
\$49,999 or less	percent of farms	36	17	35	40	26	35
\$50,000-\$99,999	do.	17	11	24	20	16	19
\$100,000-\$499,999	do.	42	58	39	38	44	41
\$500,000 or more	do.	d	14	d	d	14	5
Wheat production value	dollars	7,616	16,883	35,835	25,724	63,336	23,675
Farm production value	do.	197,795	366,054	117,402	111,675	398,810	174,910
Enterprise size:							
Fewer than 50	percent of farms	70	51	23	26	33	42
50-199	do.	26	33	33	34	33	31
200-399	do.	d	11	10	16	8	10
400 or more	do.	d	6	33	24	25	17
Wheat tenure acreage:							
Owned	percent of acreage	50	31	44	35	33	39
Cash-rented	do.	25	46	37	16	10	25
Share-rented	do.	26	23	18	50	57	35
Wheat type:							
Winter wheat	do.	100	100	12	99	86	64
Spring wheat	do.	0	0	88	d	14	36
Wheat production practices:							
Irrigated	do.	d	d	d	5	25	d
Fallow	do.	d	5	33	31	53	31
Double-cropped	do.	21	73	0	d	d	6
Percent straw	do.	36	7	d	d	9	6
Percent grazed	do.	d	d	d	20	d	9
Previous crop:							
Wheat	percent of farms	d	d	12	44	10	17
Corn	do.	14	29	15	3	2	11
Soybeans	do.	68	30	19	8	0	31
Fallow	do.	d	5	28	30	27	19
Production specialty:							
Cash grains	do.	67	37	57	67	39	61
Other crops	do.	d	46	d	9	45	9
Livestock	do.	33	17	43	24	16	30
Livestock:							
Beef cattle	do.	48	35	52	50	39	48
Hogs	do.	30	19	13	d	d	16
Dairy	do.	20	6	10	d	d	10
Wheat for on-farm use	percent of production	7	3	4	4	2	4
Government program:							
Payments	dollars per farm	4,720	12,230	12,101	10,787	13,448	9,278
Prog. crop participation	percent of farms	63	66	93	93	78	80
Participation in wheat	do.	57	45	81	84	69	71
Wheat base	acres	41	103	381	290	323	217
Setaside,CU and CRP	do.	31	28	72	167	181	91
Operator characteristics:							
Farming as major occupation	percent of farms	84	86	92	79	92	85
Older than 65 years	do.	15	13	22	22	29	19

d = Insufficient data for disclosure.

Table 3—Income and balance sheet statements for average wheat farm, by region, 1994

Item	Region					All FCRS farms
	North Central	South-east	Northern Plains	Central and Southern Plains	Pacific	
Number of wheat farms	90,037	15,763	60,915	82,300	16,230	265,245
Acres operated	542	653	1,608	1,260	1,284	1,062
Dollars per operation						
Gross cash income	178,400	255,189	121,145	119,153	357,587	162,396
Livestock sales	97,332	20,852	36,427	34,441	26,770	54,968
Wheat sales	6,088	13,889	27,703	19,791	33,270	17,431
Total crop sales	67,051	174,887	34,742	39,284	213,961	66,413
Government payments	4,720	12,230	12,101	10,787	13,448	9,278
Other farm-related income	3,209	33,331	10,173	14,851	70,138	14,306
Less: Cash expenses	151,091	155,724	97,954	92,253	260,921	127,627
Variable	125,996	120,692	65,487	70,565	217,899	100,209
Livestock purchases	18,643	2,279	6,995	12,907	828	12,125
Feed	34,765	7,907	5,436	4,711	9,037	15,534
Other livestock expenses	2,606	1,034	1,520	2,711	1,302	2,216
Seed and plants	7,374	10,047	5,725	3,947	16,512	6,650
Fertilizer and chemicals	22,359	41,352	17,297	13,581	50,668	21,334
Hired labor	9,538	20,120	4,775	5,480	63,161	11,095
Fuels and oils	5,522	10,120	6,484	7,162	14,733	7,089
Repairs and maintenance	9,468	11,577	8,670	8,899	23,478	10,091
Machine-hire & custom	2,617	4,656	3,202	4,146	11,330	3,880
Utilities	2,841	6,334	2,271	3,385	17,115	3,960
Other variable expenses	10,263	5,266	3,113	3,636	9,734	6,235
Fixed	25,095	35,033	32,467	21,689	43,022	27,419
Real estate & property taxes	3,696	2,403	3,461	2,636	4,377	3,278
Interest	6,231	9,480	9,455	8,954	14,895	8,540
Insurance	3,131	6,350	5,093	4,144	7,681	4,365
Rent and lease payments	12,037	16,800	14,458	5,955	16,069	11,236
Equals: Net cash farm income	27,309	99,465	23,191	26,899	96,666	34,768
Less:						
Depreciation	16,598	18,193	16,000	11,647	20,238	15,242
Non-cash labor benefits	424	619	263	465	1,911	502
Plus:						
Value of inventory change	3,859	4,257	398	581	27,124	3,494
Nonmoney income	4,729	4,668	3,586	2,998	6,494	4,034
Equals: Net farm income	18,875	89,578	10,912	18,366	108,135	26,552
Off-farm income	21,390	27,578	21,947	23,392	29,137	23,023
Total assets	712,612	576,763	603,243	454,076	977,643	615,420
Less: Total debt	82,242	80,187	120,295	96,088	143,860	98,926
Equals: Net worth	630,370	496,577	482,947	357,988	833,783	516,495
Financial position (percent of farms):						
Favorable	69	65	47	61	75	62
Marginal income	23	15	36	19	21	24
Marginal solvency	d	7	10	16	d	9
Vulnerable	d	13	7	5	d	5

d = Insufficient data for disclosure.

Table 4—Wheat production costs per planted acre, 1994-95 (excluding Government payments)

Item	United States		North Central		Southeast		Northern Plains		Central and Southern Plains		Pacific	
	1994	1995	1994	1995	1994	1995	1994	1995	1994	1995	1994	1995
Dollars per planted acre												
Cash expenses:												
Seed	7.46	7.57	13.42	14.09	12.78	13.20	7.83	7.44	5.09	5.30	9.63	10.06
Fertilizer, lime, and gypsum	16.70	20.89	37.50	43.66	32.90	36.91	12.25	15.34	13.70	17.37	26.95	32.88
Chemicals	5.69	5.86	.86	.90	6.76	6.93	7.61	7.98	2.81	2.90	14.68	15.10
Custom operations 1/	5.70	5.96	4.49	4.75	6.67	6.91	2.54	2.59	8.62	9.08	7.18	7.06
Fuel, lube, and electricity	8.55	8.47	5.15	5.28	5.52	5.20	5.82	5.99	9.80	9.44	19.79	19.45
Repairs	11.69	12.20	8.17	9.13	9.53	9.54	12.07	12.51	10.86	11.53	18.07	18.12
Hired labor	3.83	4.01	1.84	1.93	6.95	7.21	2.16	2.30	4.03	4.15	11.49	11.76
Other variable cash exp. 2/	.36	.38	.73	.74	.30	.31	.03	.03	.06	.06	3.11	3.07
Total, variable cash exp.	59.98	65.34	72.16	80.48	81.41	86.21	50.31	54.18	54.97	59.83	110.90	117.50
General farm overhead	5.36	7.00	8.13	10.34	3.91	5.13	4.18	5.45	5.22	6.74	9.67	12.45
Taxes and insurance	9.29	10.08	15.55	15.29	11.39	12.04	7.83	8.83	8.01	8.46	15.81	17.23
Interest	7.84	10.94	7.57	10.47	4.53	5.97	7.61	10.68	7.75	10.85	10.86	14.93
Total, fixed cash expenses	22.49	28.02	31.25	36.10	19.83	23.14	19.62	24.96	20.98	26.05	36.34	44.61
Total, cash expenses	82.47	93.36	103.41	116.58	101.24	109.35	69.93	79.14	75.95	85.88	147.24	162.11
Economic (full ownership) costs:												
Variable cash expenses	59.98	65.34	72.16	80.48	81.41	86.21	50.31	54.18	54.97	59.83	110.90	117.50
General farm overhead	5.36	7.00	8.13	10.34	3.91	5.13	4.18	5.45	5.22	6.74	9.67	12.45
Taxes and insurance	9.29	10.08	15.55	15.29	11.39	12.04	7.83	8.83	8.01	8.46	15.81	17.23
Capital replacement	21.87	22.81	18.19	20.27	18.60	18.64	23.41	24.24	18.63	19.77	35.02	35.08
Operating capital	1.40	1.83	1.68	2.25	1.90	2.41	1.17	1.51	1.28	1.67	2.59	3.28
Other nonland capital	11.52	11.95	10.39	11.40	10.37	10.25	13.14	13.51	9.62	10.18	14.59	14.58
Land	36.90	42.51	42.99	50.62	18.06	20.00	37.36	43.02	30.14	32.29	69.12	89.16
Unpaid labor	8.20	8.51	8.60	8.81	6.61	6.41	5.79	5.92	9.55	9.90	13.37	13.91
Total, economic costs	154.52	170.03	177.69	199.46	152.25	161.09	143.19	156.66	137.42	148.84	271.07	303.19

1/ Cost of custom operations and technical services. 2/ Cost of purchased irrigation water and baling.